Q.1) Which of the following statements are correct about Plasmapheresis?

1. It is a process of removal, treatment and return of blood plasma in circulation.
2. It is an extra corporeal therapy.
3. The process can be used to get rid of drug resistant superbugs.

Select the code from below:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.1) Solution (d)

Scientists had used a process known as plasmapheresis that is somewhat like kidney dialysis. It involved the removal, treatment, and return of blood plasma from circulation. Since the process occurs outside the body it is extracorporeal therapy. This method has potential to reduce chronic infections that may help humans in the fight against drug resistant superbugs.

Antimicrobial resistance happens when microorganisms such as viruses, bacteria, fungi and parasites change when they are exposed to antimicrobial drugs. These microorganisms are also termed as "superbugs". As a result, the medicines or drugs become ineffective and infections persist in the body futher increasing the risk of spread to others.

Q.2) Consider the following statements regarding 'National Pharmaceutical Pricing Authority':

1. NPPA is nodal government regulatory agency that controls the prices of pharmaceutical drugs in India.
2. It comes under the aegis of Ministry of Health and family welfare.
3. NPPA decides the ceiling prices of essential medicines under The Drug (Prices Control) Order 2013.

Which of the above statements are correct?

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.2) Solution (c)

- NPPA is nodal government regulatory agency that controls the prices of pharmaceutical drugs in India.
- It functions under the aegis of Union Ministry of Chemical and Fertiliser.
- It advices Union Government in matters relate to drug policies and pricing and revisions/changes in the drug policy.
- It also monitors availability of drugs, identify shortages, if any, and to take remedial steps.
- NPPA decides the ceiling prices of essential medicines under The Drug (Prices Control) Order 2013.

Q.3) India along with other countries in the South East Asian Region have signed World Health Organisation's (WHO) Call To end Tuberculosis (TB) by 2030 in the region. Which of the following statements are correct about TB?

1. It is bacterial disease which generally affects the lungs but can also affect other parts of the body.
2. It is a communicable disease which generally spreads through physical contact with the infected person.
3. If the TB strain shows resistance to first line drugs, it is called Multiple Drug Resistant TB (MDR TB).

Select the code from below:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.3) Solution (c)

India along with other countries in the South East Asian Region have signed World Health Organisation's (WHO) Call To end Tuberculosis (TB) by 2030 in the region. It was signed by Health ministers from countries in WHO South-East Asia Region (WHO SEARO) during two-day ministerial meeting towards ending TB in the region held in New Delhi.

TB is a bacterial disease which in humans is usually caused by an organism called Mycobacterium tuberculosis (M. tuberculosis). TB is an abbreviation of the word Tuberculosis and is how people usually refer to the disease.

You get TB by inhaling TB bacteria that are in the air. The bacteria spread through the air from one person to another. Bacteria get released into the air by some person who is already infected with them. When a person with TB of the lungs or throat coughs, sneezes, sings or talks, droplets containing the bacteria are released into the air. That is why people who think they may be infectious, may often hold something over their mouth when they are near to other people. People working in a health clinic may for this reason sometimes wear a mask.

Multi-drug-resistant tuberculosis (**MDR-TB**) is a form of tuberculosis (TB) infection caused by bacteria that are resistant to treatment with at least two of the most powerful first-line anti-TB medications (drugs), isoniazid and rifampin. Some forms of TB are also resistant to second-line medications, and are called extensively drug-resistant TB (XDR-TB).

Q.4) Consider the following statements:

1. Genetic Engineering Appraisal Committee (GEAC) is top biotech regulator in India which comes under the Ministry of Environment and Forest.
2. Currently Bt Cotton is the only GM crop which is being cultivated in India.

Which of the above statements are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.4) Solution (c)

The top biotech regulator in India is Genetic Engineering Appraisal Committee (GEAC). The committee functions as a statutory body under the Environment Protection Act 1986 of the Ministry of Environment & Forests (MoEF). It was earlier known as Genetic Engineering Approval Committee. Under the EPA 1986 Rules for Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells, GEAC is responsible for granting permits to conduct experimental and large-scale open field trials and also grant approval for commercial release of biotech crops.

The country has yet to approve commercial cultivation of a GM food crop. The only genetically modified cash crop under commercial cultivation in India is cotton.

1) Bt Cotton – For the time being, the only genetically modified crop that is under cultivation in India is Bt cotton which is grown over 10.8 million hectares. Bt cotton was first used in India in 2002.

2) Bt Brinjal – The GEAC in 2007, recommended the commercial release of Bt Brinjal, which was developed by Mahyco (Maharashtra Hybrid Seeds Company) in collaboration with the Dharward University of Agricultural sciences and the Tamil Nadu Agricultural University. But the initiative was blocked in 2010.

3) GM Mustard – GEAC has recently given a go ahead for tests of GM mustard before taking a decision on commercialization.

Q.5) *Mission Indradhanush* is a government of India initiative to ensure full immunisation of all children in India. Which of the following statements are correct about this mission?

1. The mission targets full immunisation of children under 2 years and pregnant women.
2. Currently mission covers seven vaccine preventable diseases.

Select the code from below:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.5) Solution (a)

The ultimate goal of Mission Indradhanush is to ensure full immunization with all available vaccines for children up to two years and pregnant women.

The mission was launched with an aim to cover all the children who are lack vaccination or are partially vaccinated against seven vaccine preventable diseases which include diphtheria, whooping cough, tetanus, polio, tuberculosis, measles and hepatitis B, by the end of the year 2020.

Last year four new vaccines were added in the mission. The new vaccines includes, inactivated polio vaccine, adult Japanese Encephalitis vaccine, Rotavirus vaccine and Measles Rubella vaccine.

Q.6) Rubella has been recently added in the Universal Immunisation program. Consider the following statements regarding 'Rubella':

1. It is a contagious bacterial infection.
2. It is also known as German measles.
3. Rubella infection in pregnant women may cause fetal death.

Which of the above statements are correct?

a) 1 only
b) 2 and 3
c) 1 and 3
d) All of the above

Q.6) Solution (b)

Rubella is a contagious, generally mild viral infection that occurs most often in children and young adults.

Key facts

- Rubella is a contagious, generally mild viral infection that occurs most often in children and young adults.
- Rubella infection in pregnant women may cause fetal death or congenital defects known as congenital rubella syndrome (CRS).
- Worldwide, over 100 000 babies are born with CRS every year.
- There is no specific treatment for rubella but the disease is preventable by vaccination.

The rubella virus is transmitted by airborne droplets when infected people sneeze or cough. Humans are the only known host.

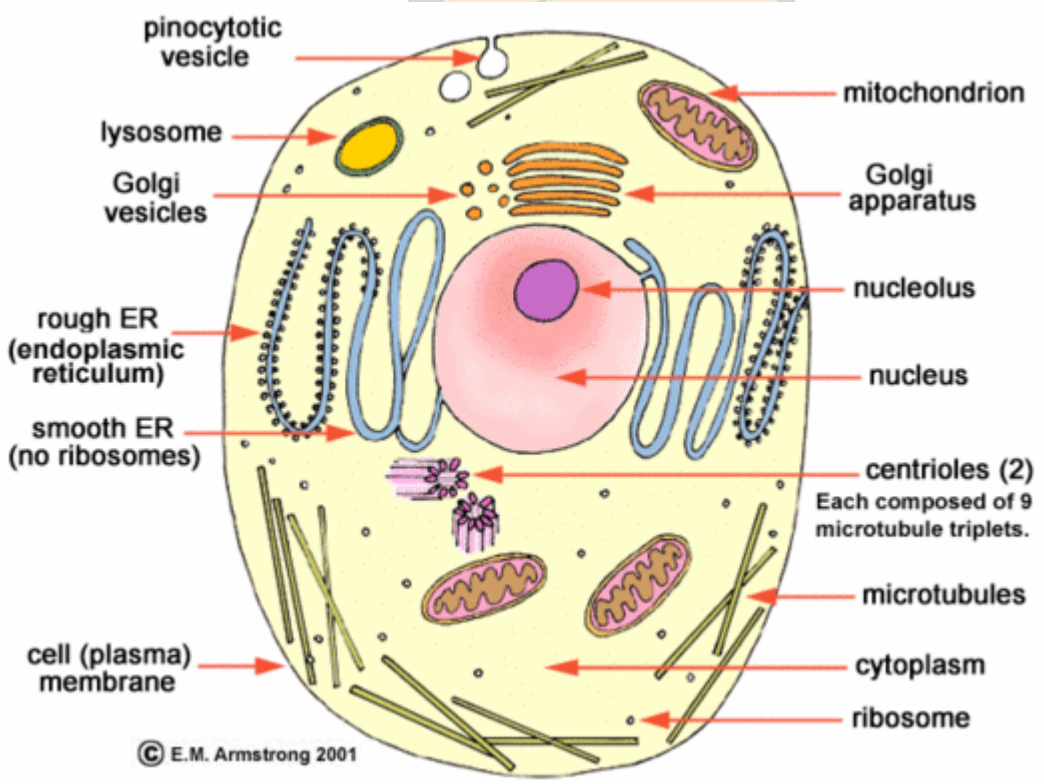
Q.7) In which of the parts of a cell, DNA is found?

a) Mitochondria
b) Nucleus
c) Golgi Apparatus
d) All of the above

Q.7) Solution (b)

The main organelles of a cell are as follows :

- cell membrane.
- endoplasmic reticulum.
- Golgi apparatus.
- lysosomes.
- mitochondria.
- nucleus.
- perioxisomes.
- microfilaments and microtubules.



Deoxyribonucleic acid DNA is a molecule that carries the genetic instructions used in the growth, development, functioning and reproduction of all known living organisms and many viruses. DNA and RNA are nucleic acid (Found in the nucleus of a cell) ; alongside proteins, lipids and complex carbohydrates (polysaccharides), they are one of the four major types of macromolecules that are essential for all known forms of life. Most DNA molecules consist of two biopolymer strands coiled around each other to form a double helix.

The two DNA strands are termed polynucleotides since they are composed of simpler monomer units called nucleotides. Each nucleotide is composed of one of four nitrogen-containing nucleobases—cytosine (C), guanine (G), adenine (A), or thymine (T)—a sugar called deoxyribose, and a phosphate group.

Q.8) Cloning is the process of producing similar populations of genetically identical individuals. Which of the following statements are correct about cloning?

1. Cloning does not occur naturally.
2. Cloning of organisms can occur through asexual reproduction.
3. Dolly, a sheep, was the first mammal to be artificially cloned.

Select the code from following:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.8) Solution (b)

In biology, **cloning** is the process of producing similar populations of genetically identical individuals that occurs in nature when organisms such as bacteria, insects or plants reproduce asexually. Cloning in biotechnology refers to processes used to create copies of DNA fragments (molecular cloning), cells (cell cloning), or organisms.

Reproductive cloning generally uses "somatic cell nuclear transfer" (SCNT) to create animals that are genetically identical. This process entails the transfer of a nucleus from a donor adult cell (somatic cell) to an egg from which the nucleus has been removed, or to a cell from a blastocyst from which the nucleus has been removed. If the egg begins to divide normally it is transferred into the uterus of the surrogate mother. Such clones are not strictly identical since the somatic cells may contain mutations in their nuclear DNA. Additionally, the mitochondria in the cytoplasm also contains DNA and during SCNT this mitochondrial DNA is wholly from the cytoplasmic donor's egg, thus the mitochondrial genome is not the same as that of the nucleus donor cell from which it was produced.

Dolly was the first mammal to have been successfully cloned from an adult somatic cell.

Q.9) Consider the following statements:

1. Rotavac is an anti – diarrhea vaccine that protect against Rotavirus.

2. It has been developed by India.
3. The vaccine is directly injected in the body of infants as well as adults.

Which of the above statements are correct?

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.9) Solution (a)

Highly contagious rotaviruses are the leading cause of severe diarrheal illnesses among infants and young children in both developed and resource-limited countries. Each year, rotavirus-induced diarrheal disease kills roughly 435,000 children younger than 5 years old and hospitalizes an estimated two million children worldwide, largely in developing countries. The youngest children — those between 6 months and 2 years of age — are most vulnerable.

ROTAVAC is a new rotavirus vaccine that consists of a strain of the virus that was isolated, manufactured and tested in India. The ROTAVAC trial represents a significant victory for India's scientific community. Based on the study's successful findings, infants in India will gain access to a licensed vaccine and its significant protection against severe rotavirus-induced gastroenteritis.

The World Health Organization recommends the first dose of vaccine be given right after 6 weeks of age. Two or three doses more than a month apart should be given, depending on the vaccine administered. Because the majority of cases occur between six months and two years of age, the vaccine is not recommended for use in children over two years of age

Q.10) A new male contraceptive 'Vasalgel' has been developed by the scientists of California National Primate Research Center. Which of the following statements are correct about 'Vasalgel'?

1. It is an irreversible and permanent form of contraceptive in males.
2. Vasalgel is a hydrogel which is injected in the sperm tract to block sperms.
3. Cutting of the duct as in Vasectomy is not required in this procedure.

Which of the above statements are correct?

a) 1 and 2
b) 2 and 3
c) 1 and 3

d) All of the above

Q.10) Solution (b)

Scientists from California National Primate Research Centre, US have successfully tested a new male contraceptive 'Vasalgel' that blocks sperm flow on monkeys.

Vasalgel is a high molecular weight polymer containing styrene-alt-maleic acid (SMA) dissolved in dimethyl sulfoxide.

The polymer forms a hydrogel after injection into the sperm-carrying tube vas deferens, creating a blockage to the passage of sperm rather than cutting it as in vasectomy, to filter sperms from the fluid ejaculation.

The contraceptive effect of Vasalgel can also be reversed by flushing the material out with a simple sodium bicarbonate solution.

Significance: The purpose Vasalgel is to prevent pregnancy, not just by eliminating sperm in larger animals more anatomically. In over a last century, male contraceptive options have not changed and currently are limited to vasectomy (meant to be permanent) and condoms and withdrawal (with high pregnancy rates). Vasagel could be the first long-acting, non-hormonal, potentially reversible male contraceptive to reach market.

Q.11) Which of the following statements are correct about Bradycardia?

1. It is a condition characterised by a slow heart rate, usually fewer than 60 beats per minute.
2. In this case heart is unable to pump enough oxygen-rich blood to the body during normal activity or exercise, causing dizziness, shortness, fatigue of breath or fainting spells.
3. Pacemakers are the most common way to treat bradycardia.

Which of the above statements are correct?

a) 1 only
b) 1 and 2
c) 2 and 3
d) All of the above

Q.11) Solution (d)

Scientists for the first time have successfully implanted world's smallest pacemaker dubbed as Micra Transcatheter Pacing System (TPS) in a patient in United States. The pacemaker about size of large vitamin capsule is for patients with bradycardia, a condition characterised by a slow heart rate, usually fewer than 60 beats per minute.

Patients with bradycardia have lower heart rate and their heart is unable to pump enough oxygen-rich blood to the body during normal activity or exercise, causing dizziness, shortness, fatigue of breath or fainting spells. Pacemakers are the most common way to treat bradycardia to help restore the heart's normal rhythm and relieve symptoms by sending electrical impulses to the heart to increase the heart rate.

Q.12) Potency of a cell is its ability to develop into differentiated cells. In the light of this statement, consider the following statements:

1. A totipotent cells have the ability to create an entire organism.
2. Embryonic stem cells are totipotent.

Which of the above statements are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.12) Solution (c)

Totipotency is the ability of a single cell to divide and produce all of the differentiated cells in an organism. Spores and zygotes are examples of *totipotent* cells. In the spectrum of cell potency, *totipotency* represents the cell with the greatest differentiation potential.

Totipotent cells can form all the cell types in a body, plus the extraembryonic, or placental, cells. Embryonic cells within the first couple of cell divisions after fertilization are the only cells that are totipotent. Pluripotent cells can give rise to all of the cell types that make up the body; embryonic stem cells are considered pluripotent. Multipotent cells can develop into more than one cell type, but are more limited than pluripotent cells; adult stem cells and cord blood stem cells are considered multipotent.

Q.13) Zika virus was erupted on a large scale in which more than 1.5 million people were infected. This lead WHO to declare a global health emergency. Which of the following statements regarding Zika Virus are correct?

1. It was transmitted through consumption of pork and beef.
2. Pregnant women infected with Zika virus run the risk of giving birth to babies with severe brain damage.

Select the code from below:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.13) Solution (b)

Zika virus had erupted on a large scale in mid-2015 in which more than 1.5 million people were infected, mostly in Brazil and other countries in South America. The virus is transmitted mainly by mosquitos. It causes mild, flu-like symptoms in most people, pregnant women run the risk of giving birth to babies with severe brain damage. The World Health Organization (WHO) had declared a global health emergency in February 2016, and declared it over in November 2016.

Q.14) Which of the following statements are correct about DNA and RNA?

1. Both DNA and RNA are double stranded.
2. All four Bases present in DNA and RNA are same, but their combination is different.

Which of the above statements are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.14) Solution (d)

DNA	**RNA**

Structural Name:	Deoxyribonucleic Acid	Ribonucleic Acid
Function:	Medium of long-term storage and transmission of genetic information.	Transfer the genetic code needed for the creation of proteins from the nucleus to the ribosome. This process prevents the DNA from having to leave the nucleus, so it stays safe. Without RNA, proteins could never be made.
Structure:	Typically a double- stranded molecule with a long chain of nucleotides.	A single-stranded molecule in most of its biological roles and has a shorter chain of nucleotides.
Bases/Sugars:	Long polymer with a deoxyribose and phosphate backbone and four different bases: adenine, guanine, cytosine and thymine.	Shorter polymer with a ribose and phosphate backbone and four different bases: adenine, guanine, cytosine, and uracil.
Base Pairing:	A-T (Adenine-Thymine), G-C (Guanine-Cytosine)	A-U (Adenine-Uracil), G-C (Guanine-Cytosine)
Stability:	Deoxyribose sugar in DNA is less reactive because of C-H bonds. Stable in alkaline conditions. DNA has smaller grooves where the damaging enzyme can attach which makes it harder for the enzyme to attack DNA.	Ribose sugar is more reactive because of C-OH (hydroxyl) bonds. Not stable in alkaline conditions. RNA on the other hand has larger grooves which makes it easier to be attacked by enzymes.
Unique Traits:	The helix geometry of DNA is of B-Form. DNA is completely protected by the body i.e. the body destroys enzymes that cleave DNA. DNA can be damaged by exposure to Ultra-violet rays.	The helix geometry of RNA is of A-Form. RNA strands are continually made, broken down and reused. RNA is more resistant to damage by Ultra-violet rays.

Q.15) Scientists from Ireland have claimed discovery of a new human organ named the 'Mesentery' that exists in the digestive system. It will be human body's 79th organ. Which of the following is the correct function of this organ?

a) It connects intestines to the abdomen.
b) It connects Heart to the Arteries

c) It joins muscles to the bones.
d) It connects the different segments of the back bone.

Q.15) Solution (a)

Scientists from Ireland have claimed discovery of a new human organ named the mesentery that exists in the digestive system. It will be human body's 79th organ. Mesentery connects the intestine to the abdomen. The organ was previously thought to consist of fragmented and disparate structures.

Medical students and researchers can now investigate what role the *mesentery* might play in abdominal diseases, which it is hoped could ultimately lead to new treatments. The organ is a double fold of peritoneum - the lining of the abdominal cavity - that holds our intestine to the wall of our abdomen.

Q.16) Recently Margarita Island was in news concerning 17th NAM summit. It is a part of

a) Nicaragua
b) Venezuela
c) Guatemala
d) Ecuador

Q.16) Solution (b)

Hon'ble Vice President Shri M. Hamid Ansari lead the Indian delegation at the 17th Summit of the Non Aligned Movement (NAM) to be held at Margarita Island in Venezuela.

India is one of the founding members of the Non Aligned Movement and India hosted the 7th NAM Summit in 1983 in New Delhi. The last NAM Summit was hosted by Iran in 2012.

The membership of NAM today comprises 53 countries from Africa, 39 from Asia, 26 from Latin America and the Caribbean and 2 from Europe (Belarus, Azerbaijan). There are 17 countries and 10 international organizations that are Observers at NAM. The Non Aligned Movement came into being 55 years ago when leaders of 25 developing countries met at the 1961 Belgrade Conference.

Source: http://www.thehindu.com/news/national/India-seeks-%E2%80%98concrete-action%E2%80%99-against-terror-at-NAM-summit/article14986834.ece

Q.17) Project SAKSHAM is associated with

a) New Indirect Tax Network (Systems Integration) of the Central Board of Excise and Customs (CBEC)
b) Addressing educational & livelihood needs of minorities
c) An effort to counter the illicit diversion and trafficking of methamphetamine and counterfeit medicines
d) An online mechanism to resolve mismatches in income-tax return through end to end e-service obviating the need to visit income-tax office by the taxpayer

Q.17) Solution (a)

'Project SAKSHAM'

A New Indirect Tax Network (Systems Integration) of the Central Board of Excise and Customs (CBEC).

It will help in:

- implementation of Goods and Services Tax (GST),
- extension of the Indian Customs Single Window Interface for Facilitating Trade (SWIFT) and
- other taxpayer-friendly initiatives under Digital India and Ease of Doing Business of Central Board of Excise and Customs.

Source: http://pib.nic.in/newsite/PrintRelease.aspx?relid=151194

Q.18) The debt service ratio in government finance measures

a) Overall public debt liability of the Union Government
b) Contribution of Service sector in debt management of the country
c) Burden of external debt
d) None of the above

Q.18) Solution (c)

Debt service ratio is measured by the proportion of total debt service payments (i.e. principal repayment plus interest payment) to current receipts (minus official transfers) of Balance of Payments (BoP). It indicates the claim that servicing of external debt makes on

current receipts and is, therefore, a measure of strain on BoP due to servicing of debt service obligations.

Source: http://pib.nic.in/newsite/PrintRelease.aspx?relid=150918

Q.19) Consider the following statements about Army Design Bureau

1. It has been set up to reduce its import dependence and to promote indigenous procurement
2. It will be the interface of the Indian Army for a single point contact for all stakeholders which would help R&D fraternity in developing indigenous solutions

Select the correct statements

a) Only 1
b) Only 2
c) Both 1 and 2
d) Neither 1 nor 2

Q.19) Solution (c)

ADB

- The Indian Army has set up Army Design Bureau to reduce its import dependence and to promote indigenous procurement.
- The Design Bureau has been established as a part of governments 'Make in India ' programme and will integrate all stakeholders (government, industries, academics) to enhance indigenization.
- ADB will provide a better understanding of the Army's requirements to the academia, research organisations and the industry for developing high tech defence products.
- It will be the interface of the Indian Army for a single point contact for all stakeholders which would help R&D fraternity in developing indigenous solutions.
- It will help the Indian Army to be constantly involved at every stage from conceptualisation to design to development trails and production to sustenance for its modernisation needs.
- ADB comes in the wake of rapid changes in technology and consequent changes in war fighting techniques.
- Army Design Bureau (ADB) will be similar to Navy's Naval Design Bureau (NDB) in concept but Naval Design Bureau does not actually design weapons but weapons

systems and platforms like Nuclear Submarines,frigates,destroyers or a Aircraft carrier and procures offensive and defensive weapons and other equipment like engines and auxiliary units either within India or from established weapons manufacturer from around the world .

Source: http://www.thehindu.com/todays-paper/tp-national/Army-sets-up-design-bureau-to-reduce-dependence-on-imports/article14617301.ece

Q.20) Which of the following countries are members of East Asia Summit?

1. Australia
2. United States of America
3. Philippines
4. Vietnam
5. India

Select the correct code:

a) 3, 4 and 5
b) 3 and 4
c) 1, 3, 4 and 5
d) All of the above

Q.20) Solution (d)

The East Asia Summit is a unique Leaders-led forum of 18 countries of the Asia-Pacific region formed to further the objectives of regional peace, security and prosperity. It has evolved as a forum for strategic dialogue and cooperation on political, security and economic issues of common regional concern and plays an important role in the regional architecture.

Established in 2005, EAS allows the principal players in the Asia-Pacific region to discuss issues of common interest and concern, in an open and transparent manner, at the highest level. The membership of EAS consists of ten ASEAN Member States (i.e. Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, the Philippines and Vietnam), Australia, China, India, Japan, New Zealand, Republic of Korea, Russian Federation and the USA. EAS is an initiative of ASEAN and is based on the premise of the centrality of ASEAN.

Source: http://pib.nic.in/newsite/PrintRelease.aspx?relid=149455

Q.21) Sohar Port is located in

a) United Arab Emirates
b) Egypt
c) Oman
d) Saudi Arabia

Q.21) Solution (c)

Sohar port of Oman provides a key gateway to the Gulf and central Asia.

Sohar Port and Freezone is a deep-sea port and free zone situated midway between Dubai and Muscat. With current investments of $25 billion, it is one of the world's fastest growing port and freezone developments. It lies at the centre of the global trade routes between Europe and Asia.

India is now also eyeing a role at Oman's strategically located Duqm Port, which is being developed by the Sultanate of Oman along with a special economic zone as a regional economic hub. Given the good political relations between Iran and Oman, India is trying to establish a link between the Duqm and Chabahar ports to boost connectivity.

Duqm is situated on the southeastern side of Oman and can be accessed from the Indian Ocean. With India taking an interest in port development in the region, the idea was to develop a Iran-India-Oman link for sea trade. In February this year Oman and Iran launched a separate shipping route between the Shahid Rajaee Port and Sohar Port to promote trade.

Source: http://www.business-standard.com/article/economy-policy/oman-s-sohar-port-comes-looking-for-investments-116091000242_1.html

Q.22) Logistics Performance Index (LPI) is released by

a) World Economic Forum
b) World Bank
c) World Trade Organisation
d) United Nations

Q.22) Solution (b)

Source: http://www.hindustantimes.com/business-news/india-jumps-19-places-to-35-in-world-bank-s-logistics-performance-index/story-rHJV3bGKyEOlfmIytARgEI.html